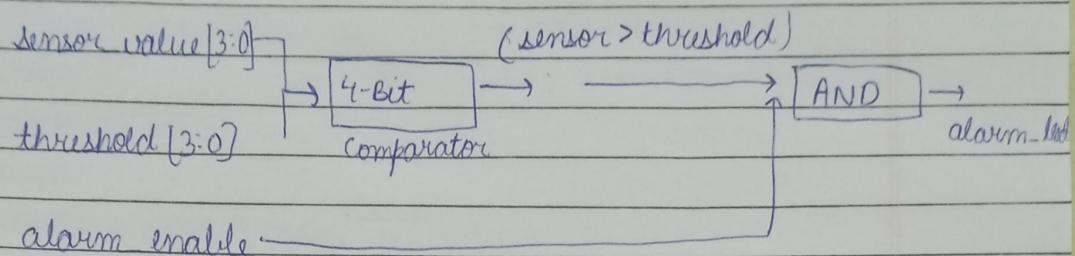


TASK 1: • Block diagram of alarm system



- clearly, comparator logic used is 4-Bit comparator as sensor and threshold value is in 4 bits

TASK 2: Truth Table:

sensor value vs threshold	alarm_enable	alarm_led
\leq threshold	0	0 } (ALARM OFF)
\leq threshold	1	0 }
$>$ threshold	0	0 }
$>$ threshold	1	1 (ALARM ON)

TASK 3 Boolean Expression

$$\text{alarm_led} = F \cdot (S > T)$$

where: S = sensor value

T = threshold

F = alarm_enable

Enable must be on and ~~sensor~~ ^{sensor} value $>$ threshold